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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
CHANG, EDITH M	

ART UNIT	PAPER NUMBER
2634	11

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/436,522	SHA ET AL.	
	Examiner	Art Unit	
	Edith M Chang	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 May 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 4-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 4-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. The final rejection is withdrawn, and the indication the allowability of claims 1,4-20 is withdrawn in view of the newly discovered reference(s) Hardin et al. (IEEE 1997). Rejections based on the newly cited references(s) follow.

Claim Objections

2. Claim 11 is objected to because of the following informalities: Add the legend, an explanatory list of the symbols in the mathematical formula, as the symbols (e.g. X,N, FBD, CP, etc.) cited in the claims the first time. Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 4-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harding et al. (U.S. Patent 6292507 B1) in view of Hardin (US Patent 5631920) and Hardin et al. ("Design considerations of phase-locked loop systems for spread spectrum clock generation compatibility", IEEE 1997 IS on EC, 18-22 Aug.1997).

Regarding **claims 1 & 13-14** Harding et al. discloses a method and a spread spectrum clock generator circuit (FIG.3/FIG.4 the SSCG, & FIG.10 the controller of the SSCG) comprising: a first circuit/means (FIG.3) configured to generate a clock signal

(136 FIG.3/4) in response to (i) a reference signal (112 FIG.3/4), (ii) a sequence of spread spectrum ROM codes (156 FIG.3, column 4 lines 37-40, column 10 lines 33-45), and (iii) a command signal (520-504 FIG.10), wherein (i) the clock signal is spread spectrum modulated and (ii) the spread spectrum modulation of the clock signal can be switched on and off in response to the command signal (502-504, 520 FIG.10, column 16 lines 47-57, wherein the command signal from 520 to 504 switches on and off the spread spectrum modulation to enable/disable 504 the counter/502 PROFILE LOCATION as in FIG.3 the 194 FROM CONTROLLER to ROM table); and a second circuit/means (138-140 FIG.3) configured to synchronize the command signal to a feedback signal (194 & 140 FIG.3). Further the incorporated reference Hardin ('920) teaches wherein the sequence of spread spectrum ROM codes is generated according to a predetermined mathematical formula (column 4 lines 39-44, column 5 line 12-column 6 line 20) and optimized in accordance with predetermined criteria (column 4 lines 44-46, lines 49-52 FIG.8, column 14 lines 20-30). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the teaching by Harding in Harding et al.'s SSCG to generate a clock signal to reduce the EMI components' effect.

Regarding **Claim 4**, further Harding discloses the SSCG is used with a motherboard or CPU (column 1 lines 19-30, FIG.1 & column 2 lines 59-63). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the SSCG of Hardin et al. used with a motherboard or CPU taught by Hardin to reduce the spectral amplitude of EMI components of this relatively high frequencies digital circuit or processors (column 2 lines 25-32).

Regarding **claims 5 &19**, Harding et al. discloses a circuit and it method to generate one or more control signals (194 & 192 FIG.3, 500, 532, 534 FIG.10) in response to (i) the command signal (182 FIG.4, 520-504 FIG.10), and (ii) the feedback signal (140, 124, 126 FIG.3, I2/I3 FIG.4) to synchronize the command signal to the feedback signal.

Regarding **claims 6 & 7**, Harding et al. discloses the second circuit comprising a first latch (331 FIG.7, column 13 lines 49-51) and a second latch (332 the D flip-flop in 302 FIG.7).

Regarding **claim 8**, Harding et al. discloses the predetermined criteria are applied to the clock signal during a transition period when spread spectrum modulation is switching on or off (FIG.8, column 3 lines 10-13, column 14 lines 20-30, 40-50, wherein the switching on or off during the transition period changes the N counter where is the predetermined criteria applied to the clock signal).

Regarding **claims 9 & 10**, Harding et al. discloses the predetermined criteria including a predetermined minimum frequency and a predetermined maximum frequency for the clock signal (column 14 lines 20-30, wherein the minimum one is 48.25 MHz, the maximum one is 50 MHz).

Regarding **claim 11**, further Hardin et al. (IEEE 1997) teaches the predetermined mathematical formula cited in the claim (page 304 left column equation (1) wherein the I_{CP} is the CP, the current form of the charge pump as shown in Figure 3 on page 303, N_{FB} is the FDB, etc.). Both mathematical formulae are derived from the same model, Figure 3 of Hardin et al. (IEEE 1997) as the FIG.5 of the instant application. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the

mathematical formula derived from the same model taught by Hardin et al. (IEEE 1997) to analyze the timing parameters of PLL to reduce the EMI /radiated emission (page 306 Conclusions).

Regarding **claim 12**, Harding et al. discloses the sequence of spread spectrum ROM codes is optimized using a computer program to simulate transient behavior apparatus (FIG.8, column 20-30, lines 50-68).

Regarding **claim 15**, further Harding teaches steps of *selecting* a number of ROM codes according to predetermined mathematical formula to *generate* a spread spectrum modulation signal (column 1 lines 19-29, column 5 line 12-column 6 line 24 of U.S. Patent 5631920). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the steps taught by Hardin in Hardin et al.'s SSCG to generate a clock signal to reduce the EMI components' effect.

Regarding **claim 16**, except implicitly specify recording transient behavior of the clock signal until PLL is in spectrum steady-state, Harding et al. discloses all subject matter claimed: the sub-steps (FIG.11-14) of (A) initializing a PLL at power supply ramping (600-602 FIG.11); (B) stabilizing the PLL with spread spectrum modulation turned off (604 FIG.11, column 21 lines 25-30); (C) loading the sequence of spread spectrum ROM code (606-616 FIG.11); (D) switching on spread spectrum modulation (618 FIG.11 wherein the logic state machine switch on/off the spread spectrum modulation); (F) switching off spread spectrum modulation (624 FIG.12); (G) recording transient behavior of the clock signal until spread spectrum modulation is completely off (G FIG.12); (H) comparing recorded transient behavior to predetermined criteria (FIG.8-9); (I) if the recorded transient behavior does not meet the predetermined criteria, shifting

the sequence of spread spectrum ROM code, wherein a last ROM code is moved to a first position and remaining ROM codes are shifted one position forward (D FIG.12-->D FIG.11, 612-616 FIG.11, 154-156-158-138 FIG.3 502-508-R1/R2/R3 FIG.10, column 10 lines 33-37, wherein the codes sequentially loaded into adder from the table as cited) (J) if the recorded transient behavior meets the predetermined criteria, finalizing the sequence of spread spectrum codes; (D FIG.12) and (K) repeating sub-steps (D) through (J) until the recorded transient response meets the predetermined criteria (D FIG.14). *However* Hardin et al. (IEEE 1997) teaches (E) recoding transient behavior of the clock signal until PLL is in spread spectrum steady-state (page 303 right column lines 32-33, page 304 right column the last paragraph, Figure 6, 7, & 8). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the step of recording until PLL is in spread spectrum steady-state taught by Hardin et al. (IEEE 1997) in Hardin et al.'s method to analyze the timing parameters of PLL to reduce the EMI /radiated emission (page 306 Conclusions).

Regarding **claim 17**, Harding et al. discloses the sub-steps performed by a computer program (column 20 lines 4-12, TABLE 2).

Regarding **claim 18**, Harding et al. disclose the controlling a feedback divider (138 FIG.3) with the sequence of spread spectrum ROM codes (164 FIG.3).

Regarding **claim 20**, Hardin et al. discloses the one or more control signals generated by one or more latches (200 FIG.4, FIG.5-7) configured to sample the command signal in response to the feedback signal (136-138-170-TO CONTROLELR FIG.3).

Regarding **claim 21**, Harding et al. discloses an apparatus (FIG.3/FIG.4 the SSCG, & FIG.10 the controller of the SSCG) comprising: a first circuit/means (FIG.3) configured to generate a clock signal (136 FIG.3/4) in response to (i) a reference signal (112 FIG.3/4), (ii) a sequence of spread spectrum ROM codes (156 FIG.3, column 4 lines 37-40), and (iii) a command signal (520-504 FIG.10); and a second circuit/means (138-140 FIG.3) configured to synchronize the command signal to a feedback signal (194 & 140 FIG.3) wherein the sequence of spread spectrum ROM codes is generated and optimized using a computer program to simulate transient behavior of the apparatus (FIG.11, column 20 lines 4-12). Further the incorporated reference Hardin ('920) teaches wherein the sequence of spread spectrum ROM codes is generated according to a predetermined mathematical formula (column 4 lines 39-44, column 5 line 12-column 6 line 20) and optimized in accordance with predetermined criteria (column 4 lines 44-46, lines 49-52). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the teaching by Harding in Harding et al.'s SSCG to generate a clock signal to reduce the EMI components' effect.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edith M Chang whose telephone number is 703-305-3416. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4800.

Edith Chang
October 1, 2003

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